

## 5.6 Right-Turn on Red Restrictions

### Background

Right-turn-on-red (RTOR) restrictions may be put in place to reduce conflict between movements and modes of traffic where certain conditions exist. This restriction may be incorporated at an intersection if adequate sight distance cannot be achieved; or where few gaps in main street through traffic exist for safe entry into the intersecting vehicular flow; or where mitigation of conflicts between turning vehicles and bicyclists or pedestrians is needed. A RTOR restriction may also be used in conjunction with implementation of a Leading Pedestrian Interval (LPI) (also known as Pedestrian Head Start) to maximize effectiveness of the LPI.



**Practice:** The City considers right-turn on red restrictions on a case-by-case basis with an engineering assessment consistent with Manual on Uniform Traffic Control Devices (MUTCD) guidance, with the exception of modified crash criteria specific for the City of Boulder. The MUTCD states that a No Turn on Red sign should be considered when an engineering study finds that one or more of the following conditions exists:

- Inadequate sight distance to vehicles approaching from the left (or right, if applicable);
- Geometrics or operational characteristics of the intersection that might result in unexpected conflicts;
- An exclusive pedestrian phase;

- An unacceptable number of pedestrian conflicts with right-turn-on-red maneuvers, especially involving children, older pedestrians, or persons with disabilities;
- Three or more right-turn-on-red crashes within a three-year period (the MUTCD criteria is more than three crashes in one year) for the particular approach; or
- The skew angle of the intersecting roadways creates difficulty for drivers to see traffic approaching from their left.

The City typically considers RTOR restrictions at locations where a right-turn movement crosses a high-volume multi-use path to enhance safety for bicyclists and pedestrians at these locations. The City will permanently message a right-turn-on-red restriction with fixed signage (“no turn on red” or “no turn on red when pedestrians are present”) or using right-turn protected-only phasing (red arrow) with fixed arrow or bi-modal signal heads. The City also uses variable-basis right-turn-on-red restriction utilizing LED “blank-out” signs which light up a “No Turn on Red” message only during the signal phase desired (such as if a conflicting pedestrian or bicycle movement is detected/called). See section 3.2 for additional details regarding design of right-turn signal indications.

Use of a right-turn LED “blank-out” sign to restrict RTOR movements have been installed on a case-by-case using engineering judgement where:

- An exclusive, high-volume pedestrian phase is in conflict with a permitted right turn movement (where a left or through movement can be made from the same lane as the right-turn movement);
- Where time-of-day restriction is needed to avoid conflict with bicyclists and pedestrians, such as where a right-turn movement crosses a multi-use path.

While it is intuitive that a RTOR restriction would generally reduce conflict between pedestrians and turning traffic as the vehicular driver would not be turning right across a pedestrian path while looking to their left to merge with traffic, it should be considered that a RTOR restriction shifts the conflict point to the parallel crosswalk to the drivers right as they turn (referred to as “right-turn on green” conflicts). For this reason, evaluation of any potential RTOR restriction should include an assessment of relative pedestrian volumes and exposure at both potential conflict points.

Experience with RTOR restrictions in the City of Boulder has shown that driver compliance with these restrictions can be a concern. Resources to enforce these restrictions are limited. Given the compliance concerns, use of RTOR restrictions should be selective so that respect for these restrictions is not eroded for locations where RTOR restriction use is highly justified.